



Regulation #85 Cooling Towers Subgroup December 9, 2016



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SCOPE: 85.5 Specific Limitations for Dischargers of Nutrients

- Definition of “new” domestic wastewater treatment works
- Allow all facilities to request preliminary effluent limits
- Reference monitoring requirements
- Federal facilities
- Cooling towers
- Trading
- SIC 20 Facilities

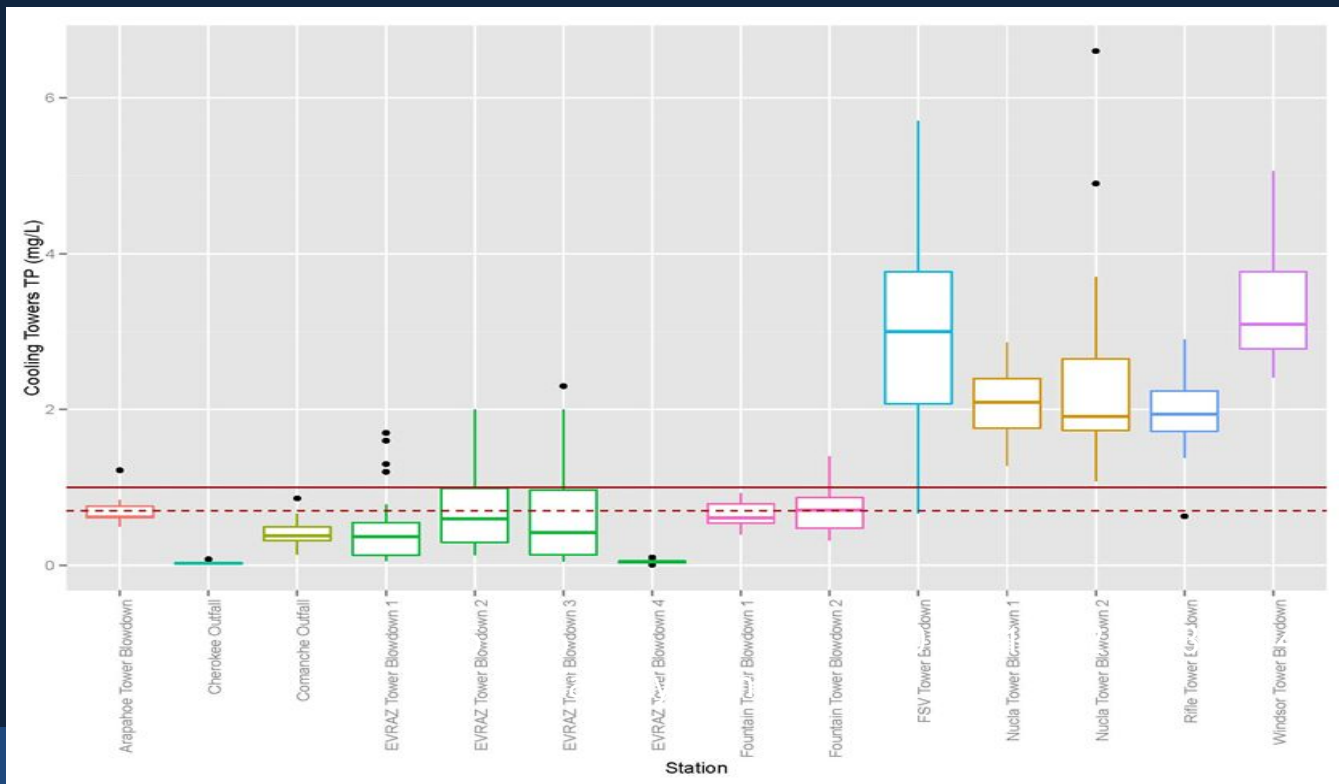
Cooling Towers in Regulation 85

- Reg 85.6(2)(a) Applicability... Monitoring of flow, TP, TN, and TIN is required for discharges from cooling towers to **determine the relative amount of nutrient (if any) that is added** to the flow diverted from state waters. Monitoring of the inflow, discharge, and any nutrient in added chemicals is required beginning November 1, 2012 and shall continue for a period of 24 months through October 31, 2014. A report summarizing all analytical results and the loads (lbs./day) in the inflow, the effluent, and added chemicals is required to be submitted by February 28, 2015.

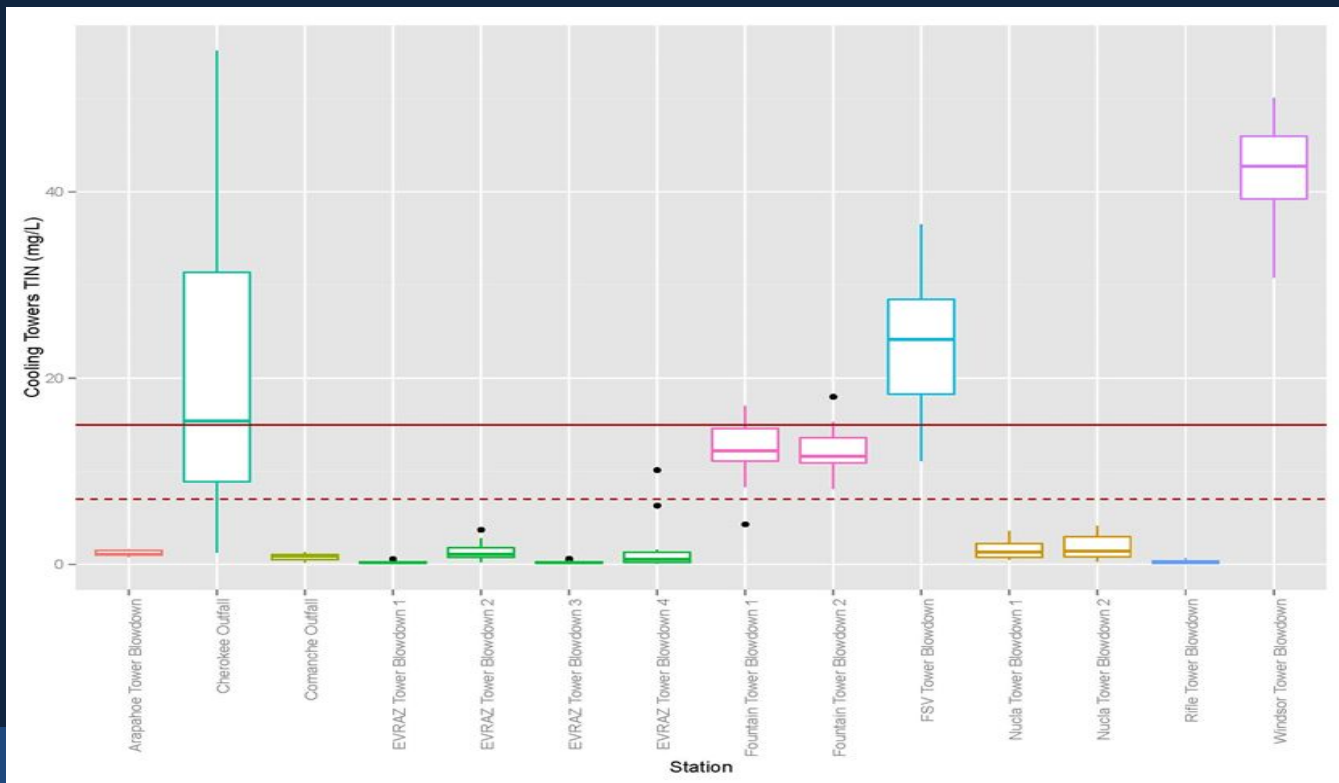
Cooling Towers in Regulation 85 Statement of Basis and Purpose

- At this time the Commission has no information upon which to determine the quantity of nutrients (nitrogen or phosphorus) that may be added to the discharge as a result of chemical use (e.g., to prevent scale formation in a cooling tower). The Commission applied an exception to discharges of noncontact cooling water that withdraw water from the stream receiving the discharge with the understanding that monitoring of flow, TP, and TIN will be required to determine the relative amount of nutrient (if any) that is added to the flow diverted from state waters. Monitoring of the inflow, discharge, and any nutrient in added chemicals would be required beginning November 1, 2012 and continue for a period of 24 months through October 31, 2014. A report summarizing all analytical results and the loads (lbs/day) in the inflow, the effluent, and added chemicals would be required to be submitted by February 28, 2015 in advance of the triennial review of Regulation #85. At the triennial review, the Commission, based on the amount of any nutrient added through chemical use, will determine whether it is necessary to control such loadings through imposition of numeric effluent limits or implementation of best management practices. The Commission has determined that this is an appropriate approach as it makes sense to determine the amount of nutrient that may be being added at these facilities before requiring effluent limits or other measures.

Cooling Towers - TP in Blowdown (Discharge) Versus Annual Median Limits



Cooling Towers - TIN in Blowdown (Discharge) Versus Annual Median Limits



Cooling Towers - TP Load

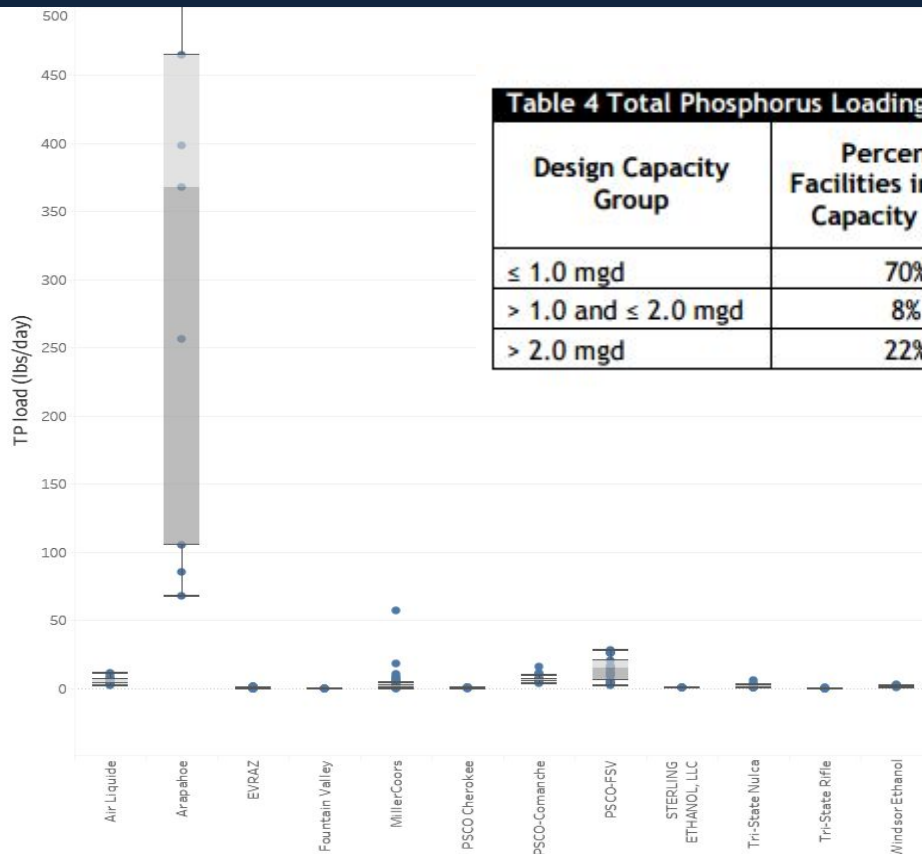


Table 4 Total Phosphorus Loading for Watershed Priority Category and Design Capacity

Design Capacity Group	Percent of Facilities in Design Capacity Group	Average total phosphorus loading (lbs/day) to:		
		High Priority Watersheds	Low Priority Watersheds	Watersheds with No Priority Designation
≤ 1.0 mgd	70%	170	210	50
> 1.0 and ≤ 2.0 mgd	8%	80	90	N/A
> 2.0 mgd	22%	3,100	910	290

Nutrient Loading for WWTF from TRIH Progress Report

Cooling Towers - TIN Load

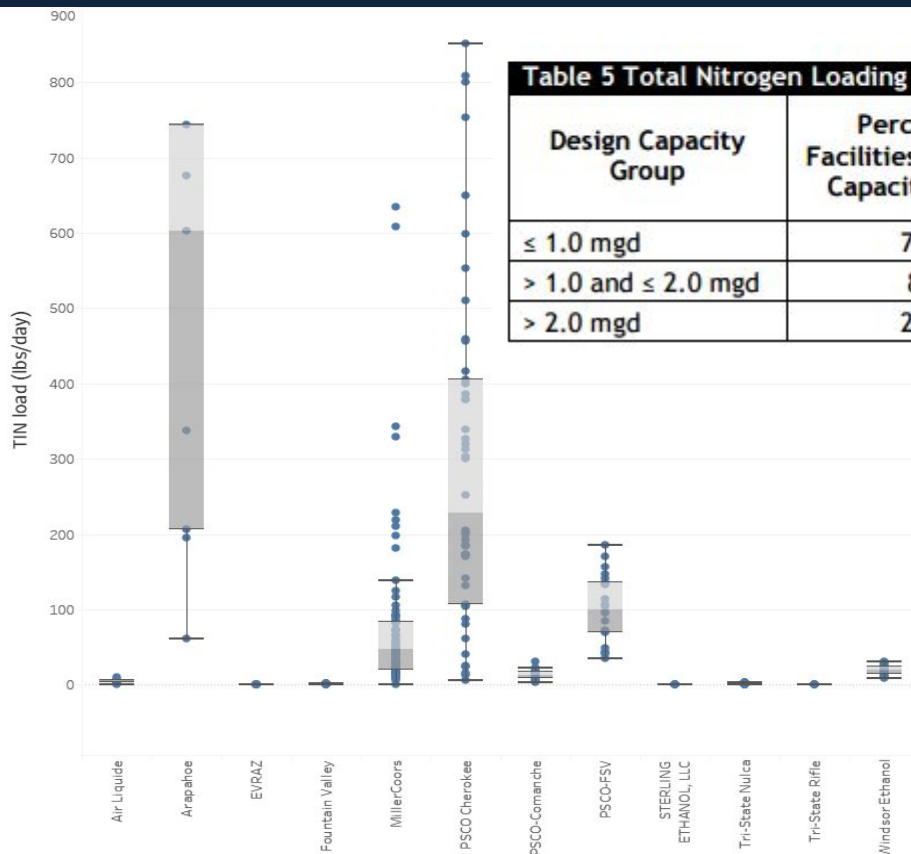


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Cooling Towers Questions

- How do we determine load from added chemicals when mass balance of nutrients in cooling towers is more complicated than $\text{inflow} + \text{chemicals} = \text{outflow}$?
 - Some facilities don't measure flow directly at (each) blowdown - do we use estimates?
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Cooling Towers Questions

- How can we best calculate nutrient loading?
 - How frequently do towers operate? Can the same daily load be multiplied by 365 to represent yearly load?
 - Do we need temporal variation or can we work with a yearly number?
- What level of nutrient loading would trigger limitations and/or BMPs?
 - Can we determine this based on, eg., average loading for < 1 MGD facilities?

Cooling Towers - Options

- Based on lower loads and less use (than WWTF), assume loading is minimal so no limits are needed.
- Based on high loading when outflow is high, assume potential impacts to Colorado's water and impose limitations (to facilities greater than XX MGD).
- Cooling tower facilities write (one time) report which addresses questions raised, calculates (or estimates) yearly load, compares to WWTF loading to determine whether it is necessary to control such loadings through imposition of numeric effluent limits or implementation of best management practices.

Discussion



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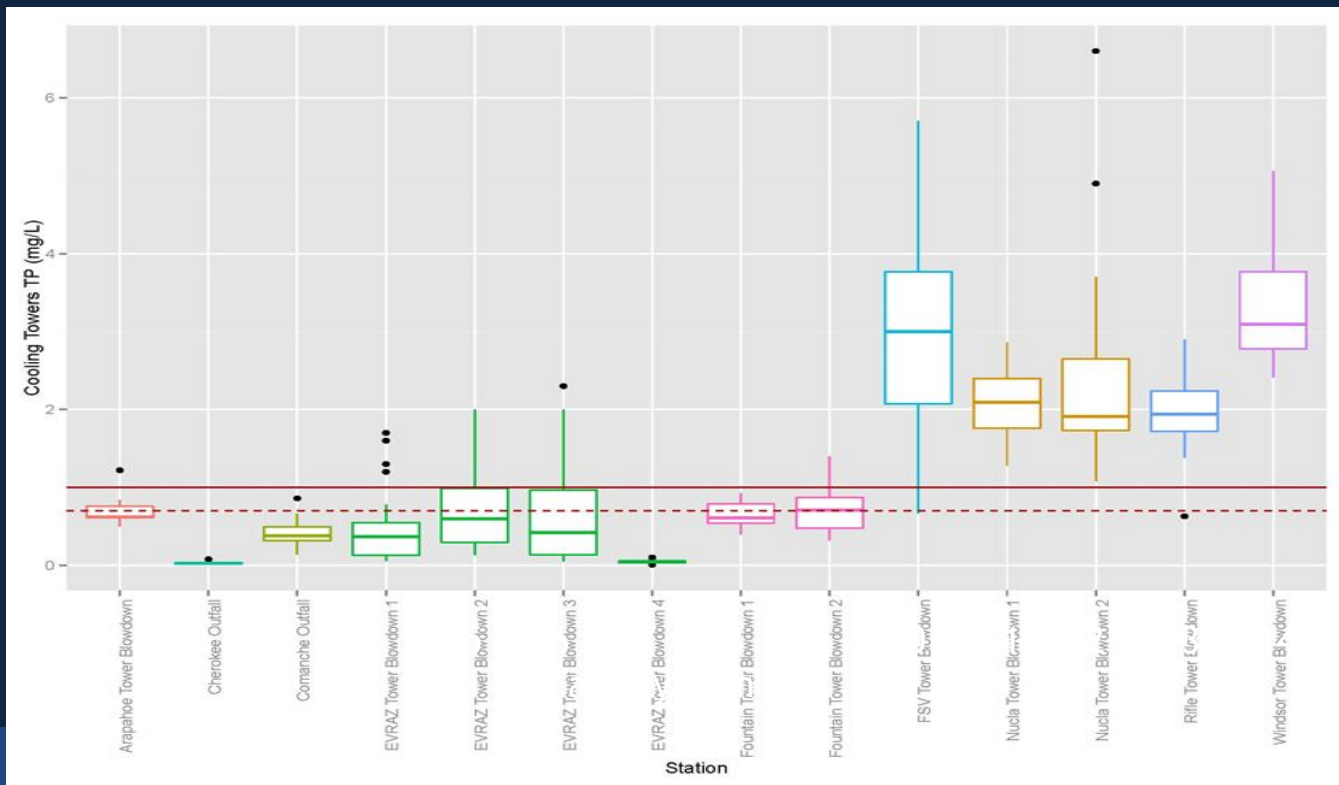
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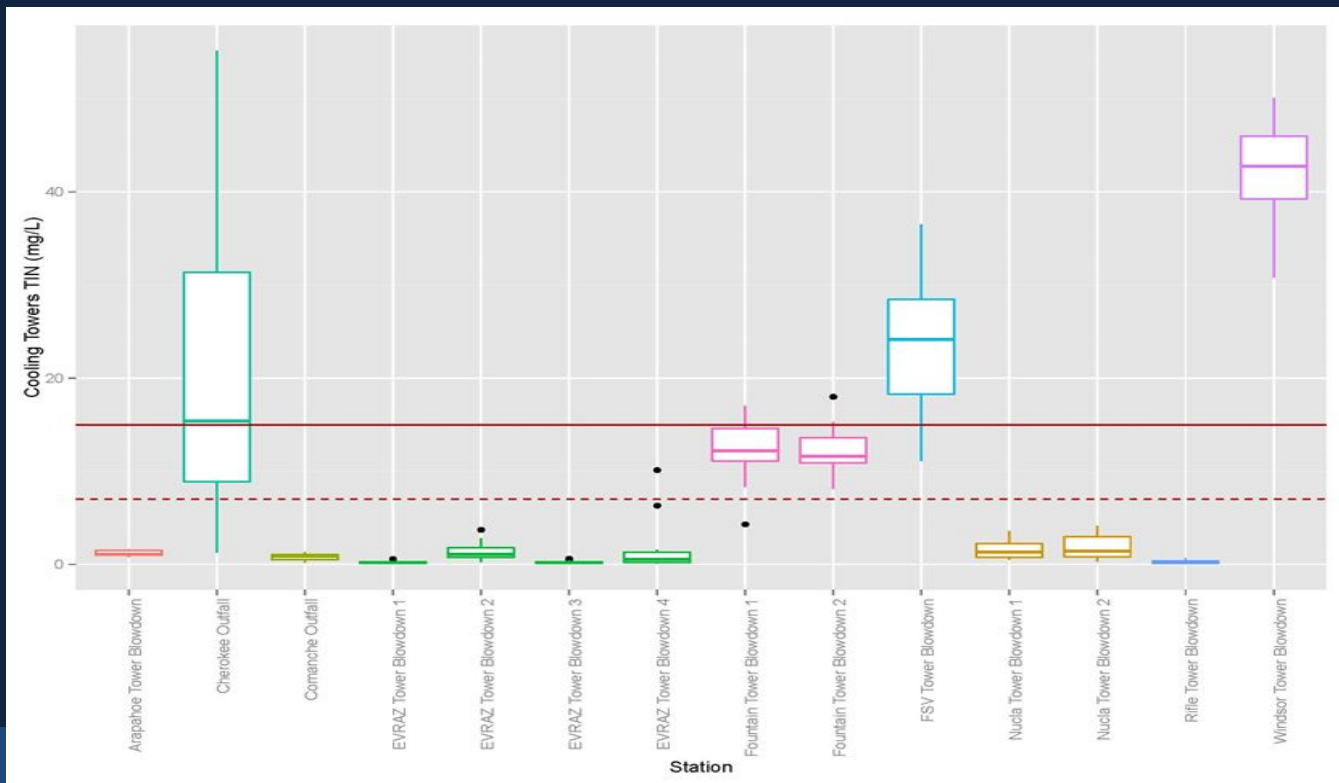
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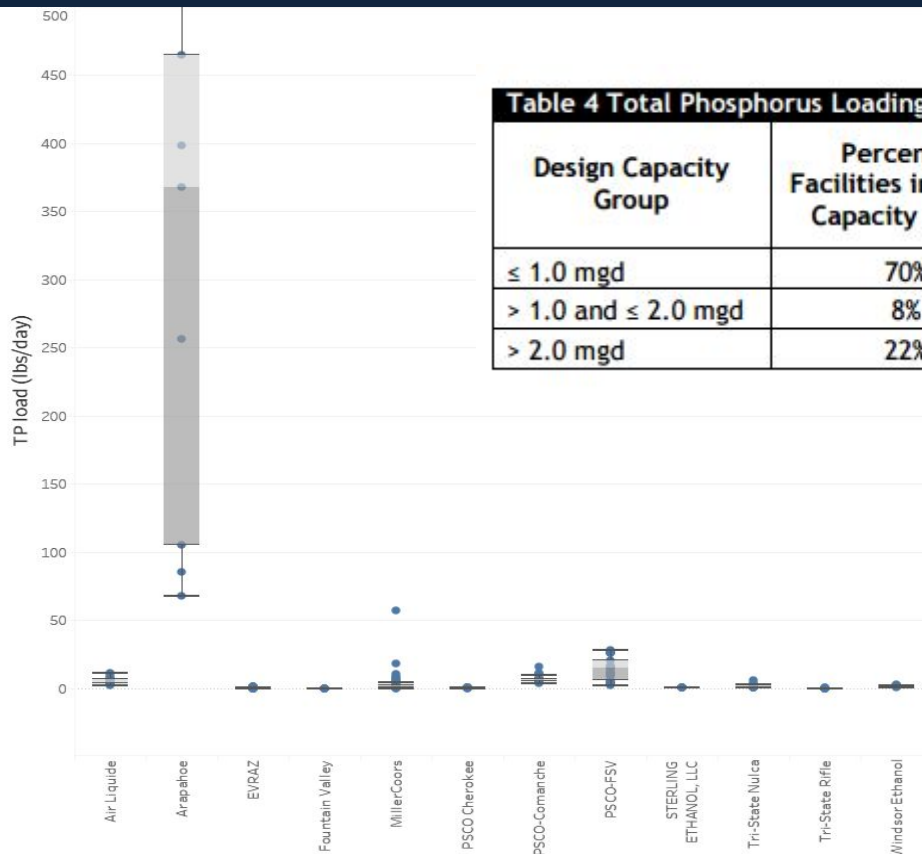


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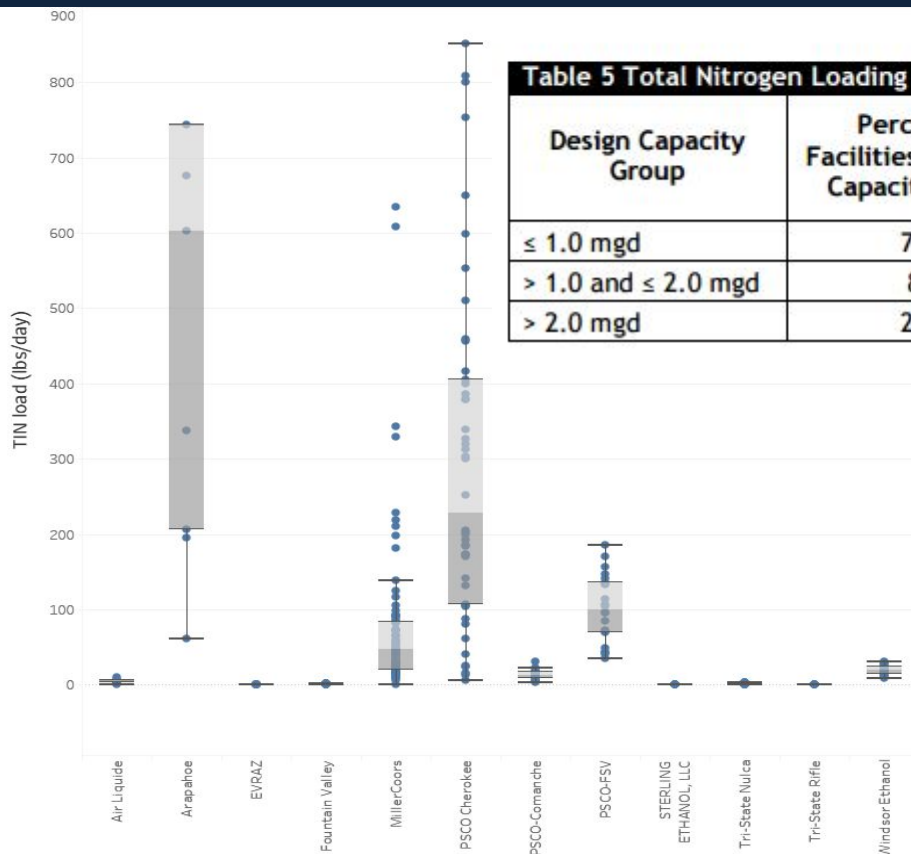


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